CLAIMS

I claim:

1.   In a computer system comprising an optical media recording device with an internal buffer, a method of preventing data underruns within the internal buffer while improving a recording rate by dynamically determining a time period to delay transferring data from the computer system to the optical media recording device when the internal buffer is unable to hold additional data, the method comprising acts of:

receiving an indication to delay data transfer from the computer system to the optical media recording device because the internal buffer is unable to hold additional data;

receiving data transfer rate information for determining a data transfer rate of the optical media recording device;

receiving size information for determining a total capacity of the internal buffer;

setting the time delay period to be less than a total time to empty the internal buffer given the total capacity of the internal buffer and the data transfer rate of the optical media recording device; and

sending data from the computer system to the optical media recording device immediately following the time delay period.

2.   The method of claim 1, wherein there are no interim attempts at sending data prior to the expiration of the time delay period.

3. The method of claim 1, wherein the data transfer rate of the optical media recording device varies over time.

4. The method of claim 1, wherein the indication to delay data transfer from the computer system to the optical media recording device is due to insufficient space in the optical media recording device's internal buffer.

5. The method of claim 1, wherein the time delay period is no larger than a time period required to empty one-third of the total capacity of the internal buffer.

6. The method of claim 1, further comprising the act of:

receiving single write size information for determining a size of a single write to the optical media recording device.

7. The method of claim 6, wherein the time delay period is a time period required to write the determined single write.

8. The method of claim 6, wherein the size of the single write is a default value of 64k bites.

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9.   In a computer system comprising an optical media recording device with an internal buffer, a method of preventing data underruns within the internal buffer while improving a recording rate by waiting a dynamically selected time period to delay data transfer from the computer system to the optical media recording device when the internal buffer is unable to receive additional data, the method comprising steps for:

temporarily stopping data transfer from the computer system to the optical media recording device because the internal buffer is unable to receive additional data;

determining a data transfer rate of the optical media recording device;

determining a capacity of the internal buffer;

waiting a time delay period dynamically selected to be less than a total time to empty the internal buffer based on the capacity of the internal buffer and the data transfer rate of the optical media recording device; and

resuming data transfer from the computer system to the optical media recording device prior to the total time to empty the internal buffer.

10.   The method of claim 9, wherein the data transfer rate of the optical media recording device is constant.

11.   The method of claim 9, wherein the step for temporarily stopping data transfer includes the act of:

receiving an indication to delay, wherein the indication to delay data transfer from the computer system to the optical media recording device is due to a returned sense code.

12.	The method of claim 11, wherein the returned sense code indicates that the optical media recording device is not ready to receive data because an operation is in process.

13.	The method of claim 11, wherein the returned sense code indicates that the optical media recording device is not ready to receive data because a long write is in process.

14.	The method of claim 9, wherein the step for temporarily stopping data transfer includes the act of:

receiving an indication to delay, wherein the indication to delay data transfer from the computer system to the optical media recording device is due to insufficient space in the optical media recording device's internal buffer.

15.	The method of claim 9, wherein the time delay period is no larger than a time period required to empty one-third of the total capacity of the internal buffer.

16.	The method of claim 9, wherein the step of waiting a time delay period comprises the act of:

receiving single write size information for determining a size of a single write to the optical media recording device.

17.	The method of claim 16, wherein the time delay period is calculated such that the optical media driver is ready to receive more than a single write size.

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18.   The method of claim 16, wherein the time delay period is the greater of a time period required to write two single write sizes or a time period required to write one-third the total capacity of the internal buffer.

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19. In a computer system comprising an optical media recording device with an internal buffer, a computer program product comprising one or more computer readable media carrying computer executable instructions that implement a method of preventing data underruns within the internal buffer while optimizing a recording rate by dynamically determining a time period to delay transferring data from the computer system to the optical media recording device when the internal buffer is unable to hold additional data, the method comprising acts of:

receiving an indication to delay data transfer from the computer system to the optical media recording device because the internal buffer is unable to hold additional data;

receiving data transfer rate information for determining a data transfer rate of the optical media recording device;

receiving size information for determining a total capacity of the internal buffer;

setting the time delay period to be less than a total time to empty the internal buffer given the total capacity of the internal buffer and the data transfer rate of the optical media recording device; and

sending data from the computer system to the optical media recording device immediately following the time delay period.

20. The computer program product of claim 19, wherein there are no interim attempts at sending data prior to the expiration of the time delay period.

21.   The computer program product of claim 19, further comprising the act of:

receiving available buffer size information for estimating a free internal write buffer size of the optical media recoding device's internal buffer.

22.   The computer program product of claim 19, wherein the indication to delay data transfer from the computer system to the optical media recording device is due to a returned sense code.

23.   The computer program product of claim 22, wherein the returned sense code indicates that the optical media recording device is not ready to receive data because an operation is in process.

24.   The computer program product of claim 22, wherein the returned sense code indicates that the optical media recording device is not ready to receive data because a long write is in process.

25.   The computer program product of claim 19, further comprising the act of:

receiving single write size information for determining a size of a single write to the optical media recording device.

26.   The computer program product of claim 25, wherein the time delay period is calculated such that the optical media driver is ready to receive more than a single write.

27.   The computer program product of claim 25, wherein the time delay period is the greater of a time period required to write two single write sizes or a time period required to write one-third the total capacity of the internal buffer.

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28. In a computer system comprising an optical media recording device with an internal buffer, a computer program product comprising one or more computer readable media carrying computer executable instructions that implement a method of preventing data underruns within the internal buffer while optimizing a recording rate by waiting a dynamically selected time period to delay data transfer from the computer system to the optical media recording device when the internal buffer is unable to receive additional data, the method comprising steps for:

temporarily stopping data transfer from the computer system to the optical media recording device because the internal buffer is unable to receive additional data;

determining a data transfer rate of the optical media recording device;

determining a capacity of the internal buffer;

waiting a time delay period dynamically selected to be less than a total time to empty the internal buffer based on the capacity of the internal buffer and the data transfer rate of the optical media recording device; and

resuming data transfer from the computer system to the optical media recording device prior to the total time to empty the internal buffer.

29. The computer program product of claim 28, wherein the data transfer rate of the optical media recording device varies over time.

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30. The computer program product of claim 28, wherein the step for temporarily stopping data transfer includes the act of:

receiving an indication to delay, wherein the indication to delay data transfer from the computer system to the optical media recording device is due to insufficient space in the optical media recording device's internal buffer.

31. The computer program product of claim 28, wherein the step of waiting a time delay period comprises the act of:

receiving single write size information for determining a size of a single write to the optical media recording device's internal buffer.

32. The computer program product of claim 31, wherein the time delay period is a time period required to write the determined single write.

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